AMENDMENTS TO THE DRAWINGS:

The attached drawing sheet includes changes to Figure 9 and replaces the original sheet that includes Figure 9. In the attached sheet, Figure 9 has been amended to clarify the components identified by element designations 62 and 66-76.

Attachments: One (1) Replacement Sheet

One (1) Annotated Sheet Showing Changes

REMARKS

This communication is a full and timely response to the non-final Office Action dated January 9, 2007. By this communication, claims 29-32 are cancelled without prejudice or disclaimer to the underlying subject matter, and claims 17, 26, 27, 35, and 36 are amended. Support for the amended subject matter can be found, for example, in Figure 1 and at page 2, lines 27-29 of the disclosure. Claims 17, 18, and 33-36 remain pending. Reconsideration and allowance of this application are respectfully requested.

On pages 2-4 of the Office Action, the drawings, the specification, and claims 27 and 36 are objected to for alleged informalities. Applicants have amended these portions of the application and respectfully request withdrawal of the objection.

In numbered paragraphs 2 and 3 on page 5 of the Office Action, claims 26, 29-32, and 35 were rejected under 35 U.S.C. §112, second paragraph. Applicants respectfully traverse these rejections, however, in an effort to expedite prosecution claims 29-32 are cancelled without prejudice and claims 26 and 35 are amended. Accordingly, withdrawal of this rejection is respectfully requested.

Beginning on page 6 of the Office Action, claims 17-28 and 33-36 were rejected under 35 U.S.C. §101. Applicants respectfully traverse these rejections. However, based on the amendment to claim 17, Applicants respectfully submit that this rejection is moot and request its withdrawal.

In numbered paragraph 5 on page 7 of the Office Action, claims 17, 18, 21-23, 29, 30, and 31 are rejected under 35 U.S.C. §102(b) as anticipated by *Neidell* (U.S.

Patent No. 4,114,153). Applicants respectfully traverse this rejection because *Neidell* fails to disclose or suggest every element recited in the claims.

As shown in Applicants exemplary Figures 1-9, a coherent burst is emitted from a radar antenna and reflected by objects in its path. The returns from the coherent bursts are split into two mutually orthogonal components, i.e., the in-phase (I) and quadrature (Q) components. A target helix, representing noise contamination of the return signal therefore imposed onto a clutter trajectory that is substantially parallel to a time axis. This helical model of the target return is fitted to the data sampled from the returns. The fit to the sampled data is optimized in a least squares fashion to minimize the error value. The best fit target radial velocity is extracted from the helix and outputted.

Independent claim 17 broadly encompasses the features described above in reciting a method extracting a radial velocity characteristic of a target, that comprises among other elements, applying a predetermined function to I-Q returns and modifying the predetermined function to match sample data as a function of velocity.

Neidell fails to disclose or suggest at least this claim element. In contrast, *Neidell* discloses a system in which a signal train is emitted into a propagation medium having an embedded reflecting target. A receiver detects the echo signals and provides these signals to a processing sequencer. The processing sequencer outputs relative velocities between the source or transmitter, receiver, and reflecting target, and the range to the reflecting target as a sum of the distance to the transmitter and the receiver (see col. 3, lines 40-52). The method used in this system gets rid of the phase information by squaring and summing the signals, then uses the range structure (time of receipt relative to start of transmission for the

pulse) of the first pulse in a coherent train as a template to find the change in range between pulses for the echoes from a target as a function of time between transmitted pulses. This approach is valid for extracting a range rate for long pulse repetition intervals, as used in active sonar or exo-atmospheric radar, but is not relative to applying a function to the I-Q returns, and modifying the function to fit the sampled data as recited in Applicants' claims.

Contrary to the Examiner's assertions, *Neidell* fails to disclose or suggest Appliçants' claimed combination of features in which a predetermined function is applied to the I-Q return and a predetermined function is modified to match the sample data as a function of velocity. At best, *Neidell* discloses that return signals are passed through a phase lens, which introduces constant phase shift data independent of ω into each frequency component of the return signals (col. 9, lines 14-18). Outside of the phase lens being introduced into the return signal path, *Neidell* fails to disclose any function being applied to sampled data of the return signal as recited in Applicants' claims. Even assuming arguendo that the phase lens could reasonably be interpreted as applying a function to the sampled data, *Neidell* does not disclose any component or steps that would reasonably be considered analogous to Applicants' claim modifying the function to match the sampled data modified this "function" as a function of velocity. For these reasons, claim 17 and its corresponding dependent claims are not anticipated. Thus, Applicants request withdrawal of this rejection.

In numbered paragraph 7 on page 12 of the Office Action, claims 19, 20, 24, 25, 28, 33, and 34 are rejected under 35 U.S.C. §103(a) as unpatentable over *Neidell* in view of *Togashi et al* (U.S. Patent No. 4,809,002). In addition, in

numbered paragraph 8 on page 15 of the Office Action, claims 26, 27, 32, 35, and 36 are rejected under 35 U.S.C. §103(a) as unpatentable over *Neidell* in view of *Togashi*, and further in view of *Evans* (U.S. Patent No. 3,860,924). Applicants respectfully traverse these rejections.

The Examiner alleges that *Neidell* discloses every element recited in the aforementioned claims except the step of extracting a radial velocity characteristic of a target from one or more coherent radiation pulse bursts and that each pulse bursts consist of multiple pulses transmitted at irregular intervals. The Examiner relies on *Togashi* and *Evans* in an effort to remedy these deficiencies. While Applicants do not acquiesce to the Examiner's assertions with respect to the disclosure of *Togashi* and *Evans*, Applicants do submit that these secondary references fail to remedy the deficiencies of *Neidell* with respect to applying a predetermined function to the I-Q return and modifying the predetermined function as recited in Applicants' claims. Particularly, both *Togashi* and *Evans* appear to teach the use of a moving target indicating system (MTI) to filter clutter from the received return signals. MTI does not use velocity extraction or the application of a predetermined function to achieve its objective of memory clutter. Thus, one of ordinary skill would not reasonably interpret these filters as being analogous to Applicants' claimed feature of applying a predetermined function. For these reasons, a *prima facie* case of obviousness has not been established.

Based on at least the foregoing amendments and remarks, Applicant submits that claims 17-28 and 33-36 are allowable, and this application is in condition for allowance. Accordingly, Applicant requests a favorable examination and consideration of the instant application. In the event the instant application can be placed in even better form, Applicant requests that the undersigned attorney be contacted at the number below.

Respectfully submitted,

BUCHANAN INGERSOLL & ROONEY PC

Date: July 9, 2007

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ANNOTATED SHEET
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TITLE: IMPROVEMENTS RELATING TO VELOCITY EXTRACTION
INVENTOR(S): DEREK GEOFFREY FINCH ET AL
ATTY DKT NO.: 1033963-000015
APPLN. NO.: 10/541,906 SHEET 2 OF 1

Fig.8.

Range ambiguity

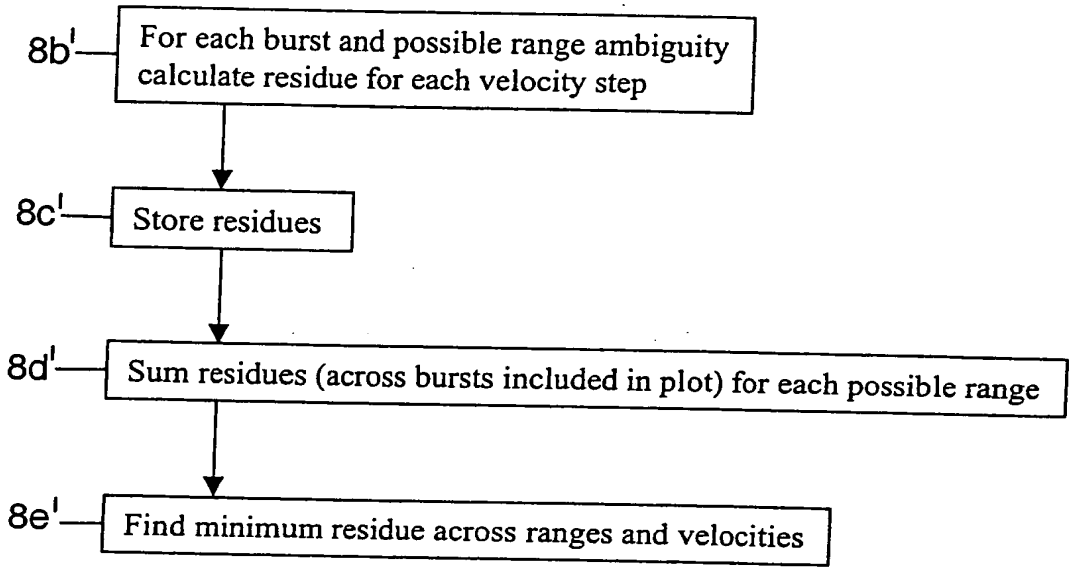

Fig.9.